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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/554,222	10/24/2005	Toshihito Miyama	P28518	7957
7055	7590	12/08/2010		
GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191				
EXAMINER				
EICHELMAYER, ALIX ELIZABETH				
ART UNIT		PAPER NUMBER		
1729				
NOTIFICATION DATE		DELIVERY MODE		
12/08/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com

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Office Action Summary

Application No.

10/554,222

Applicant(s)

MIYAMA ET AL.

Examiner

Alix Elizabeth Echelmeyer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 13-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SI.08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Interval Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 1/13/10

DETAILED ACTION

Response

1. This Office Action is in response to the Remarks filed October 11, 2010. Claims 1-33 are pending. Claims 13-32 were previously withdrawn. Claims 1-12 and 33 are rejected finally for the reasons given below.

Information Disclosure Statement

2. Applicant's arguments concerning the Information Disclosure Statement are convincing. All references have been considered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-8 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Honma et al. (US 2003/0003340).

Honma et al. teach a proton-conducting membrane (abstract). The membrane contains a support comprising an organic-inorganic compound structure (α), or an organic material which is three-dimensionally crosslinked with a structure containing a silicon-oxygen bond, and a proton conducting structure (β), or acid for imparting proton conductivity, filling the support ([0036]).

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Honma et al. teach a phase-separated structure wherein the proton conducting structure (β) forms continuous ion-conducting paths through the support ([0038]). Though Honma et al. do not explicitly call the paths pores, the skilled artisan will recognize that passageways, or pores, are formed within the crosslinked structure (α) in which the proton conducting structure (β) is found for transporting ions through the membrane.

As for claims 2, 3 and 6, Honma et al. teach the claimed support material ([0124], [0163], [0164]).

With regard to claims 4 and 5, it is seen in Figure 4 the size and volume of the pores ([0253]).

As for claims 7 and 8, Honma et al. teach varying the number of Si-O groups, which corresponds to "X" of Formula 1 of the instant claims ([0124]).

Regarding claim 33, the membrane is used in a fuel cell ([0033]).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honma et al. as applied to claim 1 above, and in further view of Curlier et al. (US 2004/0197613).

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The teachings of Honma et al. as discussed above are incorporated herein.

Honma et al. teach the proton conducting element containing sulfonic acid ([0110]) and the basic formula of claims 9, 11 and 12 ([0060]) but fail to teach the claimed formula.

Curlier et al. teach a porous cross-linked membrane having a silicon-containing acid group attached to the cross-linked material ([0204]). When the silicon-containing acid group is attached to the cross-linked material of Honma et al., such as taught by Curlier et al., the structure of claim 12 results.

With regard to claim 10, Honma et al. teach the carbon and hydrogen part of the side group ([0062]) and the addition of sulfonic acid (see above), rendering the claim obvious over Honma et al.

The skilled artisan would recognize that it would be desirable to attach the proton conducting material to the membrane, since it would prevent the material from becoming disturbed during the operation of the fuel cell.

Double Patenting

7. Claims 1, 6, 9 and 10 are rejected on the ground of nonstatutory double patenting over claims 1, 2, 8, and 9 of U. S. Patent No. 7,214,756 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are

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claiming common subject matter, as follows: the claims of '756 include the claimed cross-linked support with the claimed proton conducting structure (see above).

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Response to Arguments

8. Applicant's arguments filed October 11, 2010 have been fully considered but they are not persuasive.

It appears that Applicant has misunderstood the examiner's rejection. However, the examiner holds that Honma et al. teaches all of the limitations of claim 1, including the limitation to the support having internally-formed pores.

It appears that Applicant is interpreting claim 1 to include a limitation wherein the *membrane* is porous. The examiner finds that the claim in fact requires that the *support* is porous.

Claim 1 is provided below:

1. A proton containing membrane comprising
 - a support filled with a proton conducting structure comprising an acid-containing structure containing an acid group,
 - the support comprising an organic-inorganic composite structure having a cross-linked structure formed by a metal-oxygen bond and

an open-cell structure having internally-formed pores connected continuously to each other by said crosslinked structure.

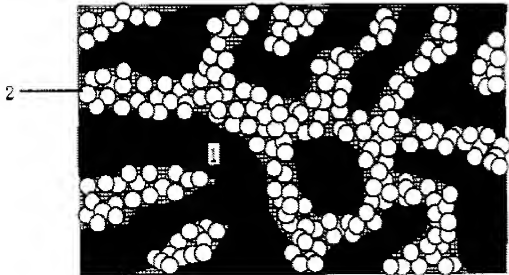
In other words, the proton conducting membrane comprises:

- a. A support
 - i. Filled with a proton conducting structure
 - ii. Comprising an organic-inorganic composite structure having a cross-linked structure formed by a metal-oxygen bond
 - iii. Comprising an open-cell structure having internally-formed pores connected continuously to each other by said crosslinked structure
- b. A proton conducting structure filling the support, where the proton conducting structure comprises an acid -containing structure containing an acid group

The support of Honma et al. is discussed above in reference to claim 1, but Applicant is reminded that the support is an organic material that is three-dimensionally cross-linked with a structure containing a silicon-oxygen bond, as required by limitation (a)(i) above.

Applicant is directed to Figure 2 of Honma et al., provided below:

Figure 2



It is clear that the support structure (2) has pores that are *filled by* the proton conducting structure (1).

Regarding Applicant's arguments concerning claims 4 and 5, the examiner notes that these claims were rejection under 102(b), not 103(a). Applicant's arguments are unclear, and the examiner upholds the rejection.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory

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period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on 571-272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Ula C Ruddock/
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